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Claim 40 has been amended. No new matter has been entered. Accordingly, claims 30, 32-34, 40-45 and 50-53 are pending in the present application.

The rejection of claim 30 under 35 U.S.C. §102(b) in the previous office action (paper no. 7) apparently has been withdrawn. However, the examiner has asserted a new ground for rejecting claim 30, which is addressed herein.

***Rejection under 35 U.S.C. §103(a)***

In the latest Office Action, claims 30, 32-34, 40-44, 50, 52 and 53 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hegel (US. 5,255,157) in view of Juskey et al. (U.S. Patent No. 5,336,931). In order to "support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP 2142 (citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)).

Regarding claim 30, the examiner asserts Hegel teaches that at least one void 21 is in the laminate so as to extend from one of the major faces through the electrically conductive layer at least as far as the underlying substrate, and encapsulating the semiconductor chip 13 and the laminate 10 with an encapsulant 16 such that the encapsulant 16 extends into the void 21 to contact the underlying substrate 10 (col. 4, lines 1-26; Fig. 4)(*emphasis added*)(see Paper No. 9, page 3). The applicant objects to the above assertion. First, no such teaching is provided by Hegel and second, such an assertion is counter to the examiner's latter assertion that "Hegel fails to disclose at least one void in the laminate so as to extend from [sic] one of the major faces through the electrically conductive layer and into said underlying substrate, but not as far as said second major..." (see id., page 4). The applicant agrees with the examiner's latter assertion as Hegel discloses that the holes 21 pass completely through the PW board

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10 (s abstract; col. 2, line 17; col. 3, lines 67-68; col. 4, lines 1, 20-21 and 35-36; and Fig. 4).

To cure the above noted deficiency in the teachings of Hegel, the examiner then points to Juskey et al. asserting that this reference teaches "at least one void in the laminate 160 so as to extend form [sic] one of the major faces and into said underlying substrate, but not as far as said second major face...." Id. The applicant also objects to this assertion as no such teaching is provided. Juskey et al. disclose that the substrate (i.e., laminate) 160 comprises "an anchor hole 150 (one shown) and a circuit connection hole 140." Col. 2, lines 56-58. As shown in FIG. 2 of Juskey et al., the anchor hole 150 goes completely through laminate 160. Specifically, Juskey et al. disclose that the "the substrate 160 is drilled to create the anchor holes 150." See col. 4, lines 57-59. Hence, the anchor holes 150 pass through the first and second major faces of the laminate 160 in a similar fashion as the laminate 10 of Hegel.

Unlike it may have been assumed by the examiner, the laminate 160 does not comprise the upper and lower solder masks 180 and 190. Rather, the solder masks 180 and 190 are attached to the first and second major faces of the laminate 160 in a dry film form. See Col. 3, lines 58-67, and col. 4, lines 63-66. Juskey et al. also disclose that "the lower solder mask 190 thereby acts as a bottom to the anchor hole 150 to prevent the cover forming material from flowing out through the bottom of the anchor hole 150 during the flow forming of the cover 110." See col. 4, lines 5-9. Accordingly, the combined teachings of Hegel in view of Juskey et al. would result in the second major face of Hegel's laminate 10 being provided with at least the lower solder mask 190 of Juskey et al. to prevent the encapsulate 16 from flowing out the bottom of holes 21. Such a resulting combination is not the claimed invention, and as the examiner is well aware, in order to establish a *prima facie* case of obviousness, *inter alia*, all of the claimed limitations must be taught or suggested by the prior art. MPEP 2143.03 (citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

Independent claim 30 recites, *inter alia*, "providing a laminate defining first and second major faces..." and "forming at least one void in said laminate so as to extend from one of said major faces through said electrically conductive layer and into said

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underlying substrate, but not as far as said second major face." Clearly, in view of the above discussion, such limitations are neither disclosed nor suggested by the cited art as the combination of Hegel and Juskey et al. does not teach having a hole in a laminate that does not extend to the second major face. Accordingly, for the above reasons, the applicant submits that the examiner has not met the requisite burden and respectfully requests that the rejection to claim 30 be withdrawn.

Regarding independent claim 32, the examiner has taken the position that the portion of the laminate layer of Hegel "that extends from one void to the next, which is directly under the device 13 constitutes a continuous laminate (i.e., uninterrupted extension in space)(see Fig. 4)." Paper No. 9, page 4. However, claim 32 recites "forming a second laminate layer over said continuous laminate layer, so as to define an underlying cavity." If the portion of the laminate 10 of Hegel, which extends from one void to the other, is considered as teaching the "continuous laminate" as suggested by the examiner, clearly then Hegel fails to teach or suggest defining an underlying cavity in such a portion of the laminate 10 under the device 13 as would be required. Accordingly, withdrawal of the rejection to claim 32 therefore is also respectfully requested.

Regarding claim 40, to clarify the recited arrangement by making explicit what was inherent, this claim now recites that the continuous laminate layer is a bottom to the void. In view of the above discussion, clearly no such feature is taught or suggested by the cited art.

Claims 33-34, 41-45 and 50-52 contain all of the limitations of the base claim from which they depend. While U.S. Patent Nos. 5,623,006 to Papathomas and 5,355,283 to Marrs et al. are cited in support of the rejection of claims 45 and 51, as noted above, these claims contain all of the limitations of the base claim from which they depend. Accordingly, for all of the reasons set forth above, the applicant respectfully requests that the remaining rejections to these dependent claims be withdrawn.

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Conclusion

The applicant respectfully submits that, in view of the above amendments and remarks, the application is in condition for allowance. The examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,  
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